

**AMENDMENTS TO THE CLAIMS:**

Claims 1-134. (Cancelled).

**135. (New)** An injectable solution for injection into a body cavity, wherein the injectable solution is obtained by the process comprising the steps of:

dissolving vinyl polymer molecules in a first solution by heating to a temperature above the melting point of the physical associations of the vinyl polymer molecules to form a vinyl polymer solution, wherein the first solution has a Flory interaction parameter ( $\chi$  value) that is not sufficient for gelation;

contacting the vinyl polymer solution with a second solution in a controlled manner, wherein after the contacting the combination of both solutions has a Flory interaction parameter ( $\chi$  value) that is sufficient for gelation and thereby forming a thetagel solution; and

maintaining the thetagel solution for a time and at a temperature such that it is in a workable state, wherein the workable thetagel solution can be injected into a body cavity as an injectable viscoelastic solution that gels *in situ* after the injection to form in the body cavity a polymer hydrogel that has physical crosslinks between vinyl polymer molecules, wherein the polymer hydrogel is formed without chemical crosslinkers, irradiation or thermal cycling.

**136. (New)** The injectable solution according to claim 135, wherein the first solution comprises one or more selected from the group consisting of deionized water, and dimethylsulfoxide.

**137. (New)** The injectable solution according to claim 135, wherein the second solution comprises one or more selected from the group consisting of salts, alcohols, polyols, amino acids, sugars, proteins, and polysaccharides.

**138. (New)** The injectable solution according to claim 135 wherein the hydrogel is anisotropic in one or more properties.

**139. (New)** The injectable solution according to claim 135, wherein the contacting comprises mixing.

**140. (New)** The injectable solution of claim 135, wherein the injectable solution comprises about 1.0 to about 50.0 weight percent polyvinyl alcohol.

**141. (New)** The injectable solution of claim 135, wherein after the contacting the Flory interaction parameter is 0.25 to 1.0.

**142. (New)** The injectable solution of claim 135, wherein the vinyl polymer solution contains one or more non-gelling components.

**143. (New)** The injectable solution of claim 135 further comprising hyaluronic acid.

**144. (New)** The injectable solution of claim 135 further comprising polyacrylic acid.

**145. (New)** The injectable solution of claim 135 further comprising a therapeutic agent.

**146. (New)** An injectable solution for injection into a body cavity, wherein the injectable solution is obtained by the process comprising the steps of:

dissolving vinyl polymer molecules in a first solution to form a vinyl polymer solution, wherein the first solution has a Flory interaction parameter ( $\chi$  value) that is not sufficient for gelation;

contacting the vinyl polymer solution with a second solution in a controlled manner such that the combination of both solutions achieves a Flory interaction parameter ( $\chi$  value) that is sufficient for gelation and thereby forming a thetagel solution; and

maintaining the thetagel solution for a time and at a temperature such that it is in a workable state, wherein the workable thetagel solution can be injected into a body cavity as an injectable viscoelastic solution that gels *in situ* after the injection to form in the body cavity a polymer hydrogel that has physical crosslinks between vinyl polymer molecules, wherein the polymer hydrogel is formed without chemical crosslinkers, irradiation or thermal cycling.

**147. (New)** The injectable solution according to claim 146, wherein the first solution comprises one or more selected from the group consisting of deionized water, and dimethylsulfoxide.

**148. (New)** The injectable solution according to claim 146, wherein the second solution comprises one or more selected from the group consisting of salts, alcohols, polyols, amino acids, sugars, proteins, and polysaccharides.

**149. (New)** The injectable solution according to claim 146 wherein the hydrogel is anisotropic in one or more properties.

- 150. (New)** The injectable solution according to claim 146, wherein the contacting comprises mixing.
- 151. (New)** The injectable solution of claim 146, wherein the injectable solution comprises about 1.0 to about 50.0 weight percent polyvinyl alcohol.
- 152. (New)** The injectable solution of claim 146, wherein after the contacting the Flory interaction parameter is 0.25 to 1.0.
- 153. (New)** The injectable solution of claim 146, wherein the vinyl polymer solution contains one or more non-gelling components.
- 154. (New)** The injectable solution of claim 146 further comprising hyaluronic acid.
- 155. (New)** The injectable solution of claim 146 further comprising polyacrylic acid.
- 156. (New)** The injectable solution of claim 146 further comprising a therapeutic agent.